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Re: Comments on the December, 1989 Phase II RI/FS Workplan for OU2.

Dear Messrs. Nelson and Warner,

The Colorado Department of Health, Division of Hazardous Materials and Waste Management (the Division) has reviewed the December 21, 1989 draft Phase II RI/FS Workplan (alluvial) for Operable Unit 2 (OU 2). Comments are being submitted five weeks ahead of the scheduled draft IAG date in order for your staffs to revise and resubmit a plan that provides for accelerated hydrogeologic and plume characterization of OU 2. The accelerated characterization is needed to design an effective Interim Measure/Interim Remedial Action (IM/IRA) for contaminated ground water. The revised report is to be submitted to the Division and EPA by April 12, 1990 as agreed during our February 7, 1990 meeting with members of your staff and EPA.

As agreed upon during the February 7, 1990 meeting, the workplan is to be divided into two steps. The first step is to characterize the hydrology of the alluvial system and all hydraulically directly interconnected units and to delineate the extent of contaminant plumes. The second step is to characterize the sources of contamination. The tasks identified to accomplish steps 1 and 2 must be thorough enough to fully meet the objectives of the RI. Conclusions made in the RI report must be based on the data collected and not on inferences where gaps in data exist. Results of the background geochemicals and seismic studies must be incorporated into the RI report.

ADMIN RECORD

A-0002-000033

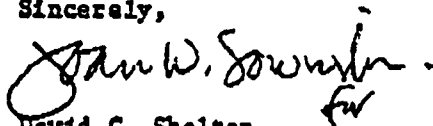
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P.03

The Division reviewed and discussed with EPA, during review of the workplan, surface water data of samples collected from within OU 2. The data indicate that volatile organics in ground water are discharging into surface water at seeps. The Division is highly concerned that the contaminated surface water is impacting the water quality of Woman and South Walnut Creeks. It is also extremely disconcerting to the Division that the release of volatiles into the creeks was not identified and addressed in the December, 1989 draft proposed IM/IRA for OU2. No actions to prevent discharge of contaminants into Woman and South Walnut Creek drainages were presented by members of your staffs during recent meetings discussing the draft proposed IM/IRA for OU2 or the draft RI/FS workplan for OU2. The Division, in conjunction with EPA, is requiring submittal of a draft proposed IM/IRA plan to address surface-water contamination by April 16, 1990. The draft proposed IM/IRA must evaluate surface water draining into both Woman Creek and South Walnut Creek.

EPA is submitting comments on the draft RI/FS workplan for OU2 under separate cover. Questions regarding the Division's and EPA's comments on the draft RI/FS workplan may be addressed during the meeting scheduled for February 27, 1990 at the Rocky Platte Plant. If you or members of staffs should have any questions or concerns that you would like to discuss prior to the next meeting, you may contact Patricia Corbetta at (303) 331-4843.

Sincerely,



David C. Shelton,
Director
Hazardous Materials and Waste Management Division

Encl.

cc: Joan Sowinski, CDH
Gary Baughman, CDH
Fred Dowsett, CDH
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CDH Comments on the Rocky Flats Plant
PHASE II RI/FS WORK PLAN
Operable Unit No. 2
December, 1989

Executive Summary

Vinyl chloride is also present in the Mound area.

Section 1.1 Environmental Restoration Program

The RCRA Facility Investigation/Remedial Investigations (RFI/RI) must also include a means for determining the rate of contaminant migration. The uppermost aquifer must be identified and the hydrogeologic characteristics of the uppermost aquifer must be determined for OU 2.

The RFI/RI also acts as a mechanism to identify areas that pose a threat to human health and the environment. If during the RFI/RI, it is determined that an immediate action must be taken to protect human health and the environment, DOE and EG&G must implement, upon CDH and EPA approval, an interim measure/interim remedial action (IM/IRA).

Reference to the proposed draft IM/IRA and decision document on p. 1-2 must be updated to reflect the current status of the plan.

As the results of the seismic geophysical study will form a basis for the Phase III investigation of the bedrock system, the results of this seismic study must be submitted to CDH and EPA prior to implementing the RI phase III field work.

It is emphasized that the characterization and remediation of the contaminated ground water is not necessarily broken into alluvial and bedrock systems but on the uppermost aquifer. If the uppermost aquifer is identified as containing parts or all of the alluvial and or bedrock aquifers, then any corrective actions/remedial actions must provide an effective means of cleanup in both the alluvium and bedrock.

Section 1.3.1.1 Plant Operations

Reference is made to past storage of hazardous and radioactive wastes. Mixed wastes must also be mentioned.

Section 1.3.1.2 Previous Investigations

The documents referenced in the section on previous investigations (1.3.1.2) are part of the administrative record and information repository. Copies of these documents must be submitted to CDH.

The workplan needs to reference the IM/IRA in progress at 881 Hillside. The draft phase III RI work plan for the 881 Hillside has now been submitted.

Section 1.3.2 Physical Setting

The neighboring cities must also be mentioned.

Section 1.3.2.3 Regional and Local Hydrogeology

Fractured and weathered zones in the Arapahoe Formation may also be permeable zones.

Information regarding the origin of the bedrock units is needed as it helps delineate the sandstone lenses in the Arapahoe Formation. The thickness of the Laramie and Fox Hill Sandstone units underlying the plant must be provided. The value of the hydraulic conductivities and dip of the beds must be given.

Section 1.3.2.5 Surrounding Land Use and Population Density

Distances to the Jefferson County Airport and subdivisions mentioned should be provided or shown on a map.

Section 1.4.1.1 903 Drum Storage Site

The chemical compositions and a list of degradation products of ethanoloamine must be provided.

The ditch impacted by the 1967 rainstorm must be located on a map. The sediment in the ditch needs to be sampled for radionuclides.

Provide a chemical description of Alk-Tri waste noted on page 1-20.

Locate the burial grounds for the drums containing the plutonium sludge. Explain what happened to the 1,254 drums that were emptied during the initial cleanup efforts.

Explain where the boxes containing contaminated soils were dumped in 1976 and 1978.

Explain how during the 1976 cleanup action, soils were removed that had a Fiddler reading greater than 250 cpm yet soils removed in the 1978 cleanup action had readings of 2,000 cpm.

Show how the amount of plutonium removed (0.5Ci or 8.2g) from the lip site was calculated.

Section 2.2.1 Geology

Cross sections and plan maps delineating the paleochannels and ridges are necessary as these features have direct bearing on ground-water flow.

The bedrock elevation contour intervals shown in Figure 2-3, should be extended beyond the extent of the Rocky Flats Alluvium. Depth to bedrock under other surficial deposits must also shown as these units are part of the uppermost aquifer.

Figure 2-3 is generated from an insufficient number of data points to extend the contours as far as shown. The 5940 contour interval, indicating the top of bedrock appears to be generated from only one data point south of Central Avenue. The data points are insufficient to conclude that a paleoridge extends eastward for several hundred feet.

Section 2.2.2.1 Unconfined Flow System

The Rocky Flats Alluvium can also discharge to weathered or fractured zones in claystone of the Arapahoe Formation.

Figures 2-3 and 2-4 do not show consistency in the predicted ground-water flow direction. For example, according to figure 2-3, ground-water would flow northeasterly from well 42-86 to a point just south of well 33-87 then change to a southeasterly direction. According to figure 2-4, ground water would flow north-northeasterly from well 42-86 toward well 33-87 and ground water flowing from 26-87 would flow toward well 33-87. The discrepancy illustrates the need for more data points and less extrapolation.

The range of velocities that coincide with the range in hydraulic conductivities must also be provided. Because hydraulic conductivity varies at the site, the velocity will also. Therefore, the ground water could be flowing at a much faster rate than indicated.

Ground-water flow velocities may not be adjusted to account for dry periods. The range of flow velocities should be provided instead.

Section 2.2.3 Surface Water Hydrology

Provide a map illustrating the surface water flow patterns. Culverts and pipes are potential pathways of contaminant migration and need to be illustrated.

Section 2.3 Nature and Extent of Contamination

Additional comments regarding statistical evaluation of the nature and extent of contamination will be included in review comments of the December, 1989 Background Geochemical Characterization Report.

If there is insufficient data to calculate a tolerance interval then the minimum detected value must be used instead of the maximum value.

Section 2.3.2 Soils

Lithium was not reported for soil analysis of the Rocky Flats Alluvium yet approximately 400 to 500 pounds of lithium were destroyed at the reactive metal destruction site (SWMU 140).

Calcium and zinc also occurred above the upper limit of the tolerance interval.

All test values must be reported (Appendix A) regardless of whether or not they exceed the upper tolerance interval or background range. These areas of exceedences must be investigated as potentially contaminated.

For radionuclide evaluation, a sample is considered statistically different from background if the measured value is greater than or equal to the background value or tolerance interval.

The same set of criteria must be used for all inorganics and radionuclides including U, Sr, Cs. The values for U, Sr, and Cs that are over the upper background tolerance limit suggest the presence of contamination.

Section 2.3.2.1 903 Pad Area

Provide the information showing that plutonium and americium are associated with the smaller soil fraction.

Explain wet screening.

The description of SWMU 109 in Section 1.4.1.3 mentions disposal of flattened drums contaminated with radionuclides. Section 2.3.2.1 attributes the high concentrations of volatiles in the SWMU to release from the SWMU. The two descriptions are not consistent.

Section 2.3.3.1 Volatile Organic Contamination

Carbon Tetrachloride

The text states that the 903 Pad and north east trenches are sources for CCl₄ as indicated by figure 2-7. However, the text also states that the CCl₄ was stored in the 903 Pad and Mound areas. There is no mention of CCl₄ storage in the East Trenches area. It is possible that the source of the CCl₄ contamination in the north trenches is also from migration of wastes from the Mound area. The revised workplan must identify potential migration pathways from the mound toward the trenches. More data is needed to support the CCl₄ plume map illustrated in figure 2-7.

Ground-water and surface-water must also be analyzed for semivolatiles (Table 2-9).

More descriptive historical information is needed for characterization of the trenches.

The contour maps shown in figures 2-7, 2-8 and 2-9 are not constructed from a sufficient number of data points to extend lines several hundred feet. The plumes illustrated are not consistent with the paleoridges and valleys described that impact ground-water flow.

Table 2-10 indicates that some data was rejected by data validation. The reason for rejection must be provided.

Determining the extent of the plumes for all contaminants, must be a priority as Walnut and Woman Creeks are downgradient from the plumes. Plume maps depicting the vertical extent of contamination are necessary.

Tetrachloroethane

The fact that 5,000 gallons of liquid containing PCE were released from the 903 Pad Area suggests that the 903 Pad Area is also a major source of PCE contamination. More wells immediately south of the pad are needed to characterize the extent of the plume vertically and horizontally.

Trichloroethane

It appears from figure 2-9, that the Trench T-2 and Reactive Metal Destruction Site are sources of TCE.

Well 35-86 is stated to have a high TCE concentration in ground water yet this is not depicted on figure 2-9. Well 35-86 is in the head waters of South Walnut Creek. Figure 2-9 indicates that wells 35-87 and 36-87 have the highest concentration of TCE in the area. High concentrations in well 36-87, the bedrock well illustrates the hydraulic interconnection between the alluvium and bedrock.

Table 2-10 shows CC14 present at a value estimated below the detection limit of 8 ppb at well 64-86. This well is south of the interceptor ditch and just north of Woman Creek. The presence of CC14 must be verified.

Data was not reported for all the parameters at all the well sites listed in Table 2-10. As stated in the footnote on Table 2-9, only nine VOCs were analyzed for the first quarter of 1987. The revised RI must present and evaluate data for all quarters since sampling initiated.

Contaminant levels at well 14-87 merit further investigation as this well is located in a drainage which empties into the south interceptor ditch.

the definition of a dry well must be provided. A well cannot be considered dry if the well is capable of yielding a sufficient amount of water for VOC sampling.

Section 2.3.3.2 Inorganic and Radionuclide Contamination

The elevated concentrations of TDS and inorganics in ground water from wells 11-87, 2-71, and 29-87 must be evaluated.

Table 2-11

The analyses for each parameter must be provided with the tolerance limit indicated.

Trend analyses must be conducted to show changes in concentrations of parameters through time and give an indication of migration pathways.

The data is insufficient to conclude that the elevated U238 occurrences are delineated by wells 14-87 and 62-86. The text describes elevated concentrations for 5 wells, 4 of which are in different geologic units indicating possible contamination. The elevated U238 value at well 29-87 must be characterized in better detail.

The limit for U238 contamination in the Mound Area is defined in the text as being wells 1-74 (weathered claystone) and 35-86 (valley fill). The data are insufficient to delineate the extent of the U238 contamination in either the Rocky Flats Alluvium or Arapahoe Formation.

Section 2.3.4 Surface Water

Data from all sampling events must be evaluated. A list of all sampling events must be provided.

Section 2.3.4.1 Surface Water Stations Southeast of 903 Pad Area

TCE, PCE, Chloroform, CCl₄, DCE, and acetone are reported to occur in seeps aligned along a drainage which discharges to the south interceptor ditch. The presence of the VOCs in surface water indicates a need for an IM/IRA to prevent further release into the Woman Creek drainage area.

Section 2.3.4.2 Upper South Walnut Creek

The source of contamination for SW60 is presumed to be within the PSZ and that source characterization will occur under a different operable unit. The releases into the Mound Area will need to be addressed as an IM/IRA as the discharge point is into the upper reaches of South Walnut Creek.

Section 2.3.6 Air

A map showing the locations of air samplers must be provided.

This section is grossly inadequate in defining the effectiveness of the air monitoring program for the 903 Pad, Mound, and East Trenches Areas.

Section 2.3.5 Biota

Define the minimum detectable activity for plutonium used in the aquatic studies and if this is the same value that would be applied in a study performed today.

Section 2.4 Applicable or Relevant and Appropriate Requirements

The list of chemical specific ARARs presented Table 2-12 must be updated to include the new site-specific surface water standards adopted as final on February 6, 1990 by the Water Quality Control Commission for tributaries to Standley Lake and Great Western Reservoir. The compliance point for these standards is where ground water discharges to the receiving stream.

Section 3.1 Phase I RI Conclusions

It should be noted in conclusion 7 that contaminants are being released to the surface water at seeps. The unconfined ground-water flow system may also contain elevated U and metals.

Section 3.2 Site-Specific Phase II RI Objectives and Data Needs

Characterize Site Physical Features

The hydraulic interconnection between the surficial deposits and bedrock must be determined through hydraulic testing. Sandstone lenses in the Arapahoe Formation must be delineated in order to evaluate the fate and transport of contaminants. Delineation can be achieved through drilling and seismic studies.

The hydraulic properties of the underlying bedrock must also be determined through aquifer testing.

During drilling, logging, and other site characterization activities, a geologic oversight program must be implemented that emphasizes consistency in geologic mapping and core logging.

Characterize Contaminant Sources

The sites causing releases to surface water must also be identified. Identify sources of radionuclides and inorganics in addition to VOCs.

Installation of wells may not necessarily be restricted to the alluvium. The impact of releases on the uppermost aquifer must be determined.

Characterization of the Nature and Extent of Contamination

The vertical and horizontal extent of contamination due to radionuclides, VOCs and inorganics in the uppermost aquifer and surface water must be determined. Ground-water monitoring wells must be installed into all hydraulically interconnected geologic units. Wells will not be restricted to the Rocky Flats Alluvium. As nitrates occur in the Mound Area, nitrate analyses must be included.

Tracking of plumes through time is necessary to determine the rate and extent of contaminant migration. Data evaluation and analyses is a necessary step to characterization of the nature and extent of contamination.

Provide a Baseline Risk Assessment

The migration pathways and receptors must be identified as part of the baseline risk assessment. Identify the migrations pathways, receptors, toxicity and quantity of contaminants.

Addition of New Categories

- Identify appropriate IM/IRAs for OU2.
- Identify and implement data management procedures.
- Identify the necessary upgrades to the air monitoring program for detection of possible releases during RI activities.

Section 4.1.3 Field Investigation

Ground-water monitoring wells will need to be installed into the appropriate geologic units so as to characterized the nature and extent of contamination and the hydraulic interconnection between surficial and bedrock units.

Section 4.1.3 Data Evaluation

Data evaluation is also the be used to determine the rate of ground-water flow and contaminant migration.

Data collected from the seismic study, drilling and other characterization activities must be evaluated and used to construct detailed cross sections and plan maps depicting the site-specific geology, hydrology, and nature and extent of contamination. Cross sections are necessary to illustrate the vertical extent of contamination and to identify data gaps. Results of the Background Geochemical Characterization Report must be incorporated into the characterization study of OU2.

Explain Kriged contours.

Section 4.1.5.4 Evaluation of Proposed Remedial Alternatives

Proposed remedial actions must address cleanup of inorganic and radionuclide contaminants as well.

Section 4.1.6.1 Public Health Evaluation

Contaminant Identification

Contaminants occurring at OU2 must be considered in the risk assessment regardless of the frequency of contaminant occurrence.

Exposure Assessment

The air pathway for migration of dispersed particulates must also be addressed.

Toxicity Assessment

In order to assess the risks from a site, the projected concentrations of all constituents analyzed must be compared to ARARs to judge the degree and extent of risk.

A summary of toxicological studies performed must include an evaluation of all constituents found to be in concentrations greater than ARARs.

CDH must also be consulted regarding the appropriateness of the data and methodologies to be used in deriving reference values.

Section 4.1.7 Treatability Studies/Pilot Testing

Treatability studies and pilot testing are necessary for all types of contaminants (radionuclides, VOCs, and inorganics) in each media (surface water and ground water in the surficial deposits and bedrock).

Section 4.1.8 Remedial Investigation Report

The RI report must also include information on the rate of contaminant migration and all data collected from Phase I and II investigations and quarterly sampling.

Section 5.1 Sampling Locations and Frequency

All wells must be sampled on a quarterly basis once the wells are developed. Wells must be completed to a depth below the vertical extent of contamination.

Section 5.1.1 Source Characterization

An additional well and borehole are necessary southeast of the metal destruction site along drainages. Well 11-87 indicates possible radionuclide and inorganic contamination in soils.

Further characterization of the area near existing well 14-87 is necessary as VOCs were detected in water from this well.

Further characterization of the area near well 64-86 is necessary to determine if Voc's have migrated south of the interceptor ditch.

At least one additional well downgradient of well 15-87 is necessary to determine the extent of contaminant migration and help delineate any paleovalleys and ridges.

In order to delineate the extent of the plume(s) from the Mound Area, an additional monitoring well located between proposed well 33-90 and existing well 17-87 may be necessary. If contamination is present at this location, additional wells located farther east between proposed well 32-90 and existing well 24-87 will be necessary to determine the extent of contamination.

As monitoring wells are installed, water-level data must be used to better define the potentiometric surface. Updated potentiometric surface maps can be used to better locate the other proposed wells.

In order to define the extent of contamination north of trenches T5 and T6, additional wells will need to be installed.

Section 5.1.2.1 Surficial Soils

Soils must be sampled for radionuclides to below the depth of known waste burial in all areas (borehole samples).

Section 5.1.2.1 Ground-water in Surficial Materials

Wells must be installed in all units which are hydraulically interconnected to the alluvium.

Section 5.2.1 Borehole Samples

Lithium analyses must be done for SWMU 140, metal destruction site. Lithium must be added to the list of parameters on Table 5-3.

Section 5.2.3 Ground-water Samples

A modified list of sampling parameters must be approved by CDH and EPA prior to implementation by DOE and EG&G.

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